HYLEBOS WATERWAY
PRE-REMEDIAL DESIGN PROGRAM
COMMENCEMENT BAY NEARSHORE / TIDEFLATS
SUPERFUND SITE

PRE-REMEDIAL DESIGN EVALUATION REPORT

November 8, 1999

7. POTENTIAL DOCK/STRUCTURE AREA SEDIMENT REMEDIATION

Eleven separate potential dock/structure sediment remedial action areas have been identified in Hylebos Waterway, as listed in Table 4-3 and shown in Figure 2-1. Capping is the primary remedial method identified in the pre-remedial design for sediment remediation behind or beneath dock/structure areas, with some consideration of limited dredging. The actual remedial actions will be developed with input from property owners on their planned upgrades (if any) to existing structures, coordination of the remedial action with ongoing operations, provisions for long-term protection of sediment left in place, as well as the outstanding issues identified in Section 14.

Placement of a cap would require special construction equipment capable of transporting capping material beneath the structure, and/or temporary removal of the deck of the pier or wharf to allow direct placement of the cap. The cap design will address the stability of each cap that is placed on a slope. In some cases the cap may incorporate a retention structure at the toe of the slope, such as a training dike or sheet pile wall, to contain the capping material behind the pierhead line of the dock. As discussed below, site-specific studies are currently underway at several dock/structure areas to determine the viability of capping. Remedial design studies will be required at the dock/structure sites to develop the final design criteria. Should final design conclude that capping is not appropriate for some of the dock/structure areas, then other options would have to be considered. If removal were required, a dredging volume of 85,000 cy is estimated for the dock/structure areas, based on a total area of 8.8 acres (Table 4-3), and an average subtidal dredging volume of 9,650 cy/acre (Table 6-1).

Each SMA with docks/structures is described below.

7.1 SMA 131 AT TACOMA BOAT

This dock-covered area is 30 feet wide and 350 feet long, between navigation channel stations 140+50 and 144+00, along the east bank of the waterway. Slopes beneath the dock are on the order of 2.5H:1V. The dock is adjacent to and parallels an open portion of intertidal slope. The upslope face of the dock starts at a mudline elevation of about 0 feet MLLW, with the downslope face of the dock at about elevation –20 feet MLLW. A typical cross-section for the 1993 existing conditions is depicted in Figure 4-16b.

Ace Tank and Equipment Company (Ace Tank) purchased the Tacoma Boatbuilding property in June 1998. With Ecology oversight, Ace Tank performed cleanup of the open intertidal areas of the site during the summer of 1998.

Ace Tank removed sediment containing sandblast grit from the open intertidal area that parallels the dock, extending out to the 0 foot (MLLW) tide line at the upslope face of the pier. The work was performed under Washington State Department of Ecology Prospective Purchaser Consent Decree No. 98-2-07617-3 and EPA Agreement and Covenant Not to Sue No. 10-98-0063-CERCLA. Sandblast grit and sediment containing sandblast grit remains in the subtidal area of SMA 131 beneath the dock. During intertidal cleanup the sandblast grit was observed to be 2 to 3 feet thick at the upslope edge of the dock. Additional sampling under and in front of the dock may be appropriate to further define the extent of SMA 131.

Two cleanup alternatives are under consideration for SMA 131: dredging and capping. Capping is viable because of the narrow width of the dock. For the same reason, it may also be possible to dredge beneath the dock. Removal may be completed during daylight periods of low tides in order to take advantage of increased clearance under the dock. Remedial design studies will be required to select the preferred remedial option at SMA 131.

7.2 SMA 132 AT MANKE LUMBER

This wharf-covered intertidal area is about 30 feet wide and 350 feet long, between navigation channel stations 156+00 and 159+50, along the east bank of the upper turning basin. Slopes beneath the wharf are on the order of 2.5H:1V. The wharf connects to the upland and extends over 80 feet into the waterway, with the mudline at the wharf face at about elevation –25 feet MLLW. A typical cross-section for the 1993 existing conditions is depicted in Figure 4-15b.

There is one sample in SMA 132 (1213I) that exceeds the ROD cleanup criteria, with a passing subtidal sample (1134S). Manke Lumber intends to complete the remediation at SMA 132 as part of the Wood Debris Group cleanup planned at the upper turning basin, with Ecology oversight. The Wood Debris Group cleanup is covered under Ecology Agreed Order No. DE 97C-5437.

7.3 SMA 231 AT ELF ATOCHEM

This dock-associated area is about 80 feet wide and 400 feet long, between navigation channel stations 119+00 and 123+00, along the west bank of the waterway. Slopes beneath the dock are on the order of 1.5 to 2.5H:1V. The dock is adjacent to and parallels an open portion of intertidal slope. The upslope face of the dock starts at a mudline elevation of about -5 feet MLLW, with the downslope face of the dock at about elevation –25 feet MLLW. A typical cross-section for the 1993 existing conditions is depicted in Figures 4-10b and 4-10c.

One intertidal composite sample (2205I) and one subtidal sample (2113S) in SMA 231 exceed the ROD cleanup criteria. Elf Atochem is currently completing a detailed engineering evaluation of capping and dredging of SMA 231. Once developed, Elf Atochem will present the design to EPA.

7.4 SMA 232 AT GENERAL METALS

The wharf-covered intertidal area is about 20 feet wide and 500 feet long, between navigation channel stations 129+50 and 134+50, along the east bank of the waterway. Prior to recent completion of a wharf construction and sediment capping project, the slopes beneath the wharf were on the order of 2 to 2.5H:1V, starting at a bulkhead that extends down to approximately elevation 0 feet MLLW. The wharf connected to the upland and extended to 20 feet into the waterway, with the mudline at the face of the dock at about elevation –10 feet MLLW.

One intertidal composite sample (2211I) collected in SMA 232 when the wharf and shoreline were as described above exceeded the ROD cleanup criteria.

During 1998 and 1999, General Metals completed a major reconstruction of the wharf facility including significant revisions to the shoreline. The shoreline improvements included an engineered cap over the sediments represented by sample 2211I (SMA 232). The cap design and construction was performed as a Sediment Removal project under an Agreed Order on Consent (AOC) with the EPA. The purpose of the sediment capping project was to remediate contaminated intertidal and shallow subtidal sediments along the shoreline of the General Metals of Tacoma (GMT) site. As stated in the AOC, the capping project was consistent with the 1989 Commencement Bay Nearshore/Tideflats Record of Decision.

The capping project consisted of:

- Removal of debris from along the entire General Metals shoreline.
- Sheet pile barrier wall installed along the existing bulkhead, driven to 30 feet below mudline.
- Geotextile fabric placed on the cleaned slope.
- A toe berm constructed to stabilize the existing slope.
- A minimum 1-foot thick gravel layer placed on top of the geotextile.
- 1 foot to approximately 8 feet of riprap placed on top of the gravel.
- A minimum of 6-inches of fish rock placed on the riprap from the base of the bulkhead down the slope to elevation minus 12.5 feet.

Pre-construction, post-capping, and post-construction surveys were performed to document that the cap thickness requirements were achieved.

The cap is bounded as follows:

- The northern edge of the cap is at the southern edge of the graving slip.
- The southern edge of the cap is 520 feet south of the slip.
- The shoreline extent of the cap is the newly constructed sheet pile bulkhead.
- The waterway extent of the cap is at bottom elevation minus 35 feet, which is approximately 70 feet into the waterway from the base of the new bulkhead and over 50 feet beyond the outboard edge of SMA 232.

GMT and EPA are currently finalizing a long-term site control plan for future monitoring of the cap.

7.5 SMA 233 AT HYLEBOS BOAT HAVEN

The marina-covered area is located in the middle turning basin of Hylebos Waterway, between navigation channel stations 112+00 and 122+00, along the east bank of the waterway. Slopes beneath the marina are on the order of 2 to 3H:1V. The marina connects to the upland by several ramps extended from the bank. The mudline at the backside of the docks is on the order of –20 to –25 feet MLLW. The marina as well as the waterway bottom contours is presented in Figure 4-1c.

Five subtidal samples in SMA 233 exceed the PCB SRAL of 450 ug/kg. Four of the stations have concentrations between 680 and 760 ug/kg PCBs, and one has a concentration of 490 ug/kg PCBs. At both intertidal stations at SMA 233 (2214I and 2215I) PCBs were undetected at a detection limit of 25 ug/kg, well below the SQO of 300 ug/kg PCBs.

Two cleanup alternatives are under consideration for SMA 233: dredging and capping. Dredging or capping may require temporary relocation of portions of the marina in order to gain access to the sediments. Capping would only be viable where the addition of capping material would not interfere with the use of the marina. Remedial design studies will be required to select the preferred remedial option at SMA 233.

7.6 SMA 431 AT TAYLOR WAY PROPERTIES

This wharf-covered area is about 20 feet wide and 300 feet long, between navigation channel stations 74+50 and 77+50, along the west bank of the waterway. Slopes beneath the wharf are on the order of 4H:1V, starting at a bulkhead that extends down to approximately elevation 0 feet to +5 feet MLLW. The timber wharf is currently out of service and in need of repair.

8. POTENTIAL ISOLATED INTERTIDAL AREA SEDIMENT REMEDIATION

Nine separate potential isolated intertidal sediment remedial action areas have been identified in Hylebos Waterway, as listed in Table 4-4 and shown in Figure 2-1. This section presents the currently preferred remedial actions for those areas.

As discussed below, independent cleanup actions and studies are currently underway at several isolated intertidal areas (see Figure 2-1 for Independent Action). The USG intertidal cleanup has received EPA approval, and it is anticipated that the remaining independent actions, each with Ecology or EPA oversight, will be successfully completed to comply with ROD standards.

A dredging volume of 10,000 cy is estimated for the isolated intertidal areas listed on Table 4-4 that have not yet had a removal action. Not included in the volume estimate are SMA 241 (completed by USG and approved by EPA), SMA 141 (removal completed by Ace Tank with Ecology oversight) and SMA 343 (removal completed by Oline with Ecology oversight). The volume is based on a total area of 1.5 acres (Table 4-4, less 141, 241, 343), and an average intertidal dredging thickness of 3½ to 4 feet.

Each isolated intertidal SMA is described below.

8.1 SMA 141 AT TACOMA BOAT

The isolated intertidal areas of the Tacoma Boat property were remediated by Ace Tank during the summer of 1998. See the discussion for SMA 131 in Section 7. Typical cross-sections for the 1993 existing conditions are depicted in Figures 4-14c and 4-16b.

8.2 SMA 142 AT J&G

This isolated intertidal area is about 25 feet wide and 150 feet long, between navigation channel stations 160+00 and 161+50, along the northeast bank of the upper turning basin. The intertidal slope is on the order of 1.5 to 2.25H:1V. The property includes a boat haul-out structure that extends from the upland out over the subtidal sediments at a slope of approximately 1 on 16. Typical cross-sections for the 1993 existing conditions are depicted in Figures 4-14b and 4-15a.

One intertidal composite sample (1212I) in SMA 142 exceeds the ROD cleanup criteria, and an adjacent shallow subtidal sample (1122S) passes the cleanup criteria.

The currently preferred remediation for SMA 142 is removal of the intertidal sediment using upland equipment, with truck transport to the sediment disposal site. Removal would be completed during daylight periods of low tides in order to provide upland access to the exposed intertidal sediment. Removal with upland based equipment has been successfully completed at several Hylebos Waterway sites, including another shipyard, Tacoma Boat (Section 7.1).

8.3 SMA 241 AT USG INTERIORS

This isolated intertidal area is about 25 feet wide and 200 feet long, between navigation channel stations 110+00 and 112+00, along the southwest shore of the waterway. The intertidal slope is on the order of 2.5 to 3.25H:1V. Typical cross-sections for the 1993 existing conditions are depicted in Figure 4-10a.

Two intertidal composite samples (2201SM, 2202I) in SMA 241 exceed the ROD cleanup criteria, and an adjacent subtidal sample (2112S) has been identified for natural recovery.

USG Interiors, Inc. performed a cleanup of SMA 241 during 1997 (AGI 1997). Upland bank soils and intertidal slope sediments were removed and disposed of offsite. The bank and intertidal area was then reconstructed. The work was accomplished under Washington State Department of Ecology Agreed Order No. DE93TC-S163. EPA reviewed the cleanup report and requested that additional material be removed from the cleanup area in order to comply with the ROD cleanup criteria. After additional material was removed in 1998, EPA and Ecology approved the USG cleanup in 1999.

8.4 SMA 242 AT DUNLAP TOWING (ELF ATOCHEM)

This isolated intertidal area is about 75 feet wide and 75 feet long, centered roughly at navigation channel station 136+50, along the southwest bank of the waterway. The intertidal slope is on the order of 5H:1V. SMA 242 is located at the log haul-out ramp of the former Dunlap Towing log yard. A typical cross-section for the 1993 existing conditions is depicted in Figure 4-11c.

One intertidal composite sample (2209I) in SMA 242 exceeds the ROD cleanup criteria.

The currently preferred remediation for SMA 242 is removal of the intertidal sediment using upland equipment, with truck transport to the sediment disposal site. Removal would be completed during daylight periods of low tides in order to provide upland access to the exposed intertidal sediment. Removal with upland-based equipment has been successfully completed at several Hylebos Waterway sites, including Tacoma Boat (Section 7.1) directly across the waterway from SMA 242.

8.5 SMA 341 AT BUFFELEN

This isolated intertidal source material is about 15 feet wide and 100 feet long, centered roughly at navigation channel station 90+00, along the southwest bank of the waterway. The intertidal slope is on the order of 4 to 5H:1V. A typical cross-section for the 1993 existing conditions is depicted in Figure 4-9a.

One intertidal composite sample (3202SM) in SMA 341 exceeds the ROD cleanup criteria.

The currently preferred remediation for SMA 341 is removal of the intertidal sediment using upland equipment, with truck transport to an offsite sediment disposal site. Removal would likely be completed during daylight periods of low tides in order to provide upland access to the exposed intertidal sediment. Removal with upland-based equipment has been successfully completed at several Hylebos Waterway sites.

Buffelen is currently discussing an independent cleanup of SMA 341 with Ecology.

8.6 SMA 342 AT MURRAY PACIFIC LOG YARD #1

This isolated intertidal area is about 75 feet wide and 75 feet long, centered roughly at navigation channel station 103+25, along the southwest bank of the waterway. The intertidal slope is on the order of 3H:1V. SMA 342 is located at the log haul-out ramp of the former Murray Pacific Log Yard #1. A typical cross-section for the 1993 existing conditions is depicted in Figure 4-9b.

Two intertidal composite samples (3208SM, 3210I) in SMA 342 exceed the ROD cleanup criteria.

The upland and bank areas of the Murray Pacific log yard were remediated in 1996 (Hydrometrics 1996) under Ecology oversight (Ecology Consent Decree No. 95-2-12876-4). The cleanup in SMA 342 extended in some of the area to elevation 0 feet MLLW, removing all of sample area 3208SM and portions of sample area 3210I. Round 2 sampling indicates that chemicals are still present above the SQO in sample area 3210I.

The currently preferred remediation for SMA 342 is removal of the remaining impacted intertidal sediment in the area of sample 3210I using upland equipment, with truck transport to the sediment disposal site. Removal would be completed during daylight periods of low tides in order to provide upland access to the exposed intertidal sediment.

8.7 SMA 343 AT OLINE

This isolated intertidal area is about 75 feet wide and 75 feet long, centered roughly at navigation channel station 103+75, along the northeast bank of the waterway. The intertidal slope is on the order of 2 to 5H:1V. A typical cross-section for the 1993 existing conditions is depicted in Figure 4-17c.

Two intertidal composite samples (3214I, 3218SM) in SMA 343 exceed the ROD cleanup criteria. An adjacent shallow subtidal sample (3117S) passes cleanup criteria.

The intertidal and adjacent upland areas of SMA 343 were remediated in 1998 under Ecology oversight (Ecology Consent Decree No. 97-2-09719-9). The results of the cleanup are currently under review by Ecology and EPA.

8.8 SMA 441 AT SIMONS & SONS

This isolated intertidal area is about 30 feet wide and 300 feet long, centered roughly at navigation channel station 80+00, along the southwest bank of the waterway. The intertidal slope is on the order of 3 to 6H:1V. A typical cross-section for the 1993 existing conditions is depicted in Figure 4-8b.

One intertidal composite sample (4206I) in SMA 441 exceeds the ROD cleanup criteria. Two subtidal samples from Round 2 boundary refinement program (T21-2, T21-3) exceed the ROD cleanup criteria. SMA 341 may become integrated with the cleanup of the adjacent subtidal area.

Simons & Sons is currently discussing an independent cleanup of SMA 441 with Ecology. The currently preferred remediation for SMA 441 is removal of the intertidal sediment using upland equipment, with truck transport to a sediment disposal site. Removal would be completed during daylight periods of low tides in order to provide upland access to the exposed intertidal sediment.

8.9 SMA 541 AT PORT OF TACOMA, 11TH STREET PROPERTY

This isolated intertidal area is about 25 feet wide and 400 feet long, centered roughly at navigation channel station 55+50, along the southwest bank of the waterway adjacent to the 11th Street Bridge. The intertidal slope is on the order of 2 to 4H:1V. Typical cross-sections for the 1993 existing conditions are depicted in Figures 4-7a and 4-7b.

One intertidal composite sample (5213I) was collected in SMA 441 during the Round 1 program. While its biological testing results passed the ROD cleanup criteria, the lead concentration was significantly elevated (85 times the SQO).

The Port of Tacoma has subsequently completed additional sampling in SMA 541 and intends to complete an independent cleanup action with Ecology oversight. Limited shallow subtidal areas that exceed ROD cleanup criteria that are not addressed by the Port cleanup action will be added to the Hylebos cleanup plan.